Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

VARIATIONS IN NATURE.

BY THOMAS MEEHAN.

THE idea that art has made most of the variations we find in gardens is far removed from the truth. It has done much to prevent a true knowledge of the origin of species. Art has done little towards making variations; it has only helped to preserve the natural evolutions of form from being crowded out. There is scarcely any species of wild plants but will furnish numberless variations, if we only look for them. To-day I examined a large patch of ox-eye daisies (*Chrysanthemum leucanthemum*). The first impression is that they are remarkably uniform, yet there were some with petals as long only as the width of the disk; others with petals double the length. In some the petals taper to a narrow point; in others they are tridentate on the apex. Again, some flowers have petals uniformly linear. Others have them tapering at both ends. Some have recurved and others flat petals. In one plant the *scales of the involucre were very much reflexed*, a very striking difference from the usually closely appressed condition.

I have frequently found that these very common things which nobody looks at, furnish as many new facts to an enquiring mind, as the rare species which every one loves to see.

OBSERVATIONS ON THE FAUNA OF THE SOUTHERN ALLEGHANIES.

BY PROFESSOR E. D. COPE.

I. On the so-called Alleghanian Fauna in General. The terms Canadian and Alleghanian, have been applied by Professors Verrill* and Agassiz† to faunal associations of species of animals, characteristic of Canada and adjacent territory, and the Middle and Eastern United States, etc. The former author, in the later essay quoted, attempts to define these faunæ in a more or less precise manner, regarding the southern boundary of the first as "coincident with a line which shall indicate a mean temperature of 50° Fahrenheit, and the southern boundary of the second, to be the line of 55°." In accordance with this view the southern boundary of the Canadian fauna, commencing at the mouth of the Penobscot River in Maine, extends parallel with the coast into New Brunswick, and returning through middle Maine passes south of Moosehead Lake and the White Mountains, along the eastern base of the Green Mountains to the south, and up their western foot to the river St. Lawrence. From near Montreal it turns to the south-west, and, passing through Lake Ontario, crosses Michigan from St. Clair to Milwaukee, and rises following the valley of the Mississippi northwards. The Adirondack Mountains were regarded as a portion of this fauna, surrounded, like an island, by the Alleghanian.

The southern boundary of the Alleghanian was traced from near Norfolk, Virginia, up the valley of the James River to the Alleghany Mountains, southward along their base to their termination in Georgia, and then north again along their western slope to Kentucky and the Ohio River. The Southern, or Louisianian, fauna included the lower portion of the Ohio basin, and an undetermined extent of that of the Mississippi north of the latter. The boundary line then descended to the south to the west of that river. I may suggest here that the most northern habitat of the *Siren lacertina* might prove to be near the northern extreme of the boundary in question. This point, so far as I am aware, is

---

*Proceedings Essex Institute, III. 136. Proceedings Boston Society of Natural History, 1866, 260.

†Nott and Gliddon, "Types of Mankind," 1853.

Alton, Illinois, from which place I have a specimen of that species.

My object at present is to show that the region, including the crest of the Alleghany Mountains to their southern extremity in Georgia, possesses a fauna in many respects entirely different from that of the southern two-thirds of the Alleghanian fauna as defined by Verrill, and in some respects as similar to the Canadian. My conclusions are based more on observations on the distribution of birds than on animals of other classes, as were also those of Professor Verrill. They are very imperfect, and I have no doubt that additional observations will increase the weight of evidence in the direction here pointed out.

Among Mammalia three species may be noticed, namely: *Sciurus Hudsonius*, *Cervus Canadensis*, *Lynx Canadensis*. The first named species is characteristically northern, and little known in the southern part of the above defined Alleghanian fauna. In southern and eastern Virginia it is unknown, as well as in North Carolina and Tennessee. It is, however, not uncommon on the summits and crests of the Alleghanies in both the former states. In North Carolina and southern Virginia it is so restricted to the heights as not even to descend into the mountain valleys. I resided for nearly two months at the Warm Springs, Madison county, North Carolina, and in Henderson county, in the same state, at an elevation of two thousand five hundred feet above the sea, without observing a single individual; yet the inhabitants are well acquainted with them as game of the mountain tops, under the name of the "Mountain Boomer," a name they bear in Virginia, also. This distribution and name are mentioned by Audubon and Bachman in their great work.

The elk is recorded by Baird as having left remains, during human habitation, in West Virginia. Of this fact I was also assured when in the same region. Dr. Hardy, of Asheville, North Carolina, states that horns of the elk were found in the woods on the Black Mountains at that southern point, when he was younger, and that he is satisfied that its range extended nearly to South Carolina during the human period. This species formerly ranged over the Alleghanian fauna, but is now nearly confined to the Canadian.

Like the red squirrel the Canada lynx extends to the southern limits of the Alleghany ranges, occupying the highest ground, though apparently not so restricted to the elevations as the first named. It is distinguished, by the name catamount, from the *Lynx rufus* which is called wild cat, and is well known to the hunters. It is known to be a northern species, being unknown in the wilds of the lower country of Virginia and North Carolina, where the *L. rufus* takes its place. What its southern limit is, in eastern and western Pennsylvania, I am unable to ascertain.

In Giles County, E. Virginia, at an elevation of five thousand feet, I observed in August, 1867, the following species of birds: *Junco hyemalis*, *Dendrœca icterocephala*, *D. Blackburniæ*, *D. cœrulescens*, *D. maculosa*, *D. virens*, *Myiodioctes Canadensis*, *M. mitralus*, *Parula Americana*, *Mniotilta varia*, *Setophaga ruticilla*. From the season at which these were observed, they evidently bred in the locality in question. They were most of them abundant.

In the high valley of Henderson county, and on the Black, Rich, and other mountains in southern North Carolina in September, 1869, I observed the following: *Junco hyemalis*, *Vireo solitarius*, *Dendrœca coronata*, *D. maculosa*, *D. virens*, *D. cœrulescens*, *D. Blackburniæ*, *Parula Americana*, *Mniotilta varia*, *Myiodioctes mitratus*, *Setophaga ruticilla*. These were also abundant, and no doubt bred in the localities in question.

These species are enumerated as especially northern forms. They pass Philadelphia in latitude 40° in early spring (April and May), on their way to northern breeding places. Rarely a *Setophaga ruticilla* breeds in that region, but the great majority accompany the northern Dendrœcas and the

Vireo solitarius. Of the list, Verrill states that *Mniotilta varia*, *Parula Americana*, *Dendrœca virens*, *D. Blackburniœ*, *D. icterocephala*, *Myiodioctes Canadensis*, *Setophaga ruticilla* and *Vireo solitarius*, breed at Norway, Maine, at the northern limit of the Alleghanian fauna. *Dendrœca coronata* and *Junco hyemalis* migrate still farther north to within the limits of the Canadian fauna, to breed: *D. maculosa*, not breeding at Norway, may have similar habits. The two former birds are regarded by Verrill as true types of the Canadian fauna, the *Junco* representing in part *Spizella socialis* of the Alleghanian, and the *D. coronata* the *D. pinus* of the same.

The southern localities now given for the species of the two lists, I have not found recorded, except in the case of *Junco hyemalis*, which according to Audubon breeds in the Virginian Alleghanies. The species mostly, and especially the last named, are confined like the red squirrel to the most elevated mountain crests. In North Carolina these range from five thousand to six thousand seven hundred and forty feet.

It is also evident that a number of species of birds, mostly wood-warblers (*Dendrœca* and other *Tanagridœ*) have an east and west, as well as north and south migration; passing to and from the Alleghany Mountains, instead of going to the New England States and Canada.

Among the Batrachia a single species is found on the high peaks of the Black Mountains, and its faunal relations are similar to the preceding. This is a species of Salamander, the *Desmognathus ochrophœa*, which is common in that Canadian island, the Adirondack Mountains, and in the Alleghanies as far south as the South of Pennsylvania. In the lower country of New England and New York it appears not to be known to naturalists, though it may occur there, while in Southern Pennsylvania it is not found. Its range extends to the Georgian Alleghanies, as a specimen similar to those from the Black Mountains was sent to the Smithsonian Institution by Dr. Jones.

The preceding species of mammals, birds, and batrachia, accompany very exactly the range of the trout (*Salmo fontinalis*). This well known fish is already in South-western Virginia, confined to the most elevated peaks and knobs, and does not even occur in the streams of many of the mountain valleys. In North Carolina its distribution is quite similar. I took it in the headwaters of the French Broad, and was satisfied that it occurs in the head of the Catawba. Dr. Hardy, of Asheville, who is very familiar with the Southern Alleghany Region, assured me that it is found in the headwaters of the Chattahoochie in Georgia, the only example of its occurrence in a river flowing directly into the Gulf of Mexico, with which I am acquainted. At the same time Dr. Peck of Mossy Creek, Tennessee, who has fished for trout in most of the Alleghany streams, is of the opinion that the fish does not occur in any streams in the Cumberland Mountains.

The wood frog (*Rana sylvatica*) also occurs on the mountains of North Carolina, but what the southern limit of its range in the low lands is, I do not know.

Of the eighteen species above enumerated, at least ten are not found in the southern half or more of the Alleghanian fauna, that is, are not known as residents about Philadelphia, and most of them are not found within a considerable distance north of that point. Of this number at least two belong exclusively to the Canadian fauna, while of the remaining eight, five (*Lynx Canadensis*, *Sciurus Hudsonius*,* *Cervus Canadensis*, *Setophaga ruticilla* and *Salmo fontinalis*), are absent or rare in the low countries south of Philadelphia.

The value of the isothermal of 65° during April, May and June, as a boundary of faunæ may thus be questioned, though it is probably as determinative as any other that could be fixed upon. Thus the limit of the breeding region of the ten northern species above alluded to might be regarded as such a boundary. This would be about the parallel of the mouth of the Connecticut (or Hudson), and it would coincide with the northern limit of several genera and species of fishes. Thus Lepidosteus, Clinostomus, Enneacanthus, Acantharchus and Carpiodes, do not exist north of this point, nor the widely distributed species *Semotilus corporalis* and *Hypsilepis analostanus.* There is, however, nearly as much change at the latitude of the Susquehanna, while at the James, Micropterus, and probably Campostoma, have their northern Atlantic limit.*

---

*A friend long resident in Loudon Co., Va. (on the Potomac), informs me that the red squirrel does not occur there. Prof. Baird gives in the 8th Vol., U. S. Pac. R. R. Rep't, measurements of specimens from Mississippi.

II. On the fauna of the Upper Valley of the French Broad River, North Carolina.—This valley is probably the most extensive for its elevation above the sea, in the Appalachian region. It may be said to extend from near Asheville at the southern extremity of the Black Mountains, to near the line of South Carolina, or the Saluda Mountains, north and south. On the east and west it is bounded by the Blue Ridge and the Cold Spring and other ranges, respectively, embracing the counties of Henderson and Transylvania and part of Buncombe. The French Broad River traverses it from south to north, taking its rise in the southern and western bounding mountain ranges. This fine valley is comparatively level, and the soil, though loamy, contains a considerable proportion of sand. The river pursues a level course with but few rapids, and through broad meadows susceptible of high cultivation. The climate is delightfully equable, being without summer heats and winter snows. The magnificent scenery, in views of the surrounding mountains, especially to the westward, have made it the Saratoga of Charleston and Mobile; and its claims, so superior in scenery to that watering place, will no doubt be some day recognized by the citizens of our northern cities.

---

*In an essay on the distribution of fishes in the Alleghanies of South-western Virginia, I stated, p. 245, that Amblodon does not occur in the Lake district. I have since ascertained, through Professor Agassiz, that it is found in Lake Champlain.

According to the measurement given by Prof. Kerr, in his first report on the progress of the Geological Survey of the State, the elevation of this valley is twenty-five hundred feet above the sea. The highest point in the great valley of the Alleghanies, on the line of the Virginia and Tennessee Railroad in south-west Virginia, is nineteen hundred feet, according to the railroad surveys. The Black Mountains rise from the Upper French Broad Valley to six thousand seven hundred and forty feet. On the south, three ranges separate it from the upper country of South Carolina, the southern escarpment of each of which presents a much greater descent than the northern.

As might have been expected, the products of this valley approximate, in some respects, those of the North. It is the source of supply for the immediately adjoining southern regions, of apples, potatoes, and cabbages that will head. In its fauna it partakes of a few northern traits. I observed the following birds there in September, so that I cannot be sure that they breed there, or that they had not descended from the surrounding mountains: *Mniotilta varia*, *Parula Americana*, *Dendrœca virens*, *D. cœrulescens*, *D. maculosa*, *Setophaga ruticilla*. The reptile fauna presented on the other hand a marked peculiarity, and I write the present notice to call attention to it. The lizard *Oligosoma laterale* Say, was common; the salamander *Spelerpes guttolineatus* was excessively abundant, and a single example of *Amblystoma talpoideum* was found there under a log, during my residence of a week. These three species have been looked upon as representing our extreme southern Reptile fauna. They have not been found hitherto north of the low country of the Gulf States, and its prolongation up the low valley of the Mississippi. The *Amblystoma* only, of the three, has occurred near Cairo, Ill. (Mus. Smithsonian). The *Speler-*

pes guttolineatus seemed to take the place in habit and manners of our *Plethodon erythronotus*, which did not occur there. The occurrence of these species at that elevation seems quite peculiar, as I did not meet with either of them in three weeks in the valley of Tennessee from ten to thirty miles north of Knoxville, nor in two months in the low country of western, middle and eastern North Carolina, in the latitude of this valley.

Besides these species, there were abundant the widely distributed *Spelerpes bilineatus*, *S. ruber*, *Amblystoma punctatum*, and *Desmognathus fuscus*. *D. niger* and *D. ochrophœus* of the neighboring mountains were not there.

As to the flora of the valley I made but few observations. The buckeyes and Gordonia of the Cumberland Mountains had disappeared, and the universal "stick-weed" (*Actinomeris squamosa*) of the Great Valley was rare. *Aconitum uncinatum* adorned the thickets with its twining stem bearing large blue flowers. The coarse *Silphium terebinthaceum* was conspicuous in the old fields, along with abundance of a common *Cratœgus*. In the woods there were three species of *Viburnum*, and the swamps were often well protected against intruders by the *Smilax laurifolia*. The moss supported abundance of the *Sarracenia purpurea*, and a second species, perhaps *S. rubra*.

The latter plant is interesting as furnishing another instance of the dependence between species of different kingdoms, for means of subsistence. The tubular leaves of this species are erect and slender, or trumpet shaped. The delicate hairs with which they are lined increase in coarseness to near the base, while they are so delicate on the inside of the free portion of the leaf as to produce the effect of iridescence. Insects which enter are imprisoned by this arrangement, and I did not examine a specimen, of the many observed, which did not contain at least an inch of dead insects of all orders, in the bottom. On the top of this mass of decay a large dipterous larva was invariably found.

It was not of a kind familiar to me, and seemed evidently to depend for subsistence on the animal matter furnished by the trap-like qualities of the *Sarracenia* leaf. I did not observe any such tenant in the *S. purpurea*, where the hollow petioles were frequently more or less filled with water.

III. On some species of Spelerpes. — In his original descriptions of North American Salamanders, published many years ago by Professor Jacob Green, he mentioned one under the name of *Spelerpes cirrigera*, which was said to have been discovered in Louisiana. This animal was small, and furnished with a marked peculiarity in the shape of a dermal appendage or tentacle, dependent from the upper lip near the nostril. In other respects the animal was allied to the *Sp. bilineatus*, the small species so generally distributed over the United States. In Holbrook's extensive work on herpetology, this species is again described and figured, but no new specimens are mentioned as having been discovered, and it is regarded as very rare. In 1869 the writer made a study of the North American salamanders preserved in the Museum of the Smithsonian Institution, and examined with much interest, among others the types of Green's description of *Spelerpes cirrigera* from Louisiana. A narrow investigation of these convinced me that no other character existed by which to distinguish them from a usual southern variety of *Sp. bilineatus*, than the two peculiar cirri originally observed by Green. Now these cirri are evidently remnants of an early larval character universal among tailed Batrachia, namely, the balancers. These are a long process on each side of the head immediately in front of the branchial processes, which appear very early, indeed almost simultaneously with the latter. They are probably homologous with the beards of the larval Dactylethra of Africa described by Wyman and Gray, which give those tadpoles so much the appearance of Siluroids, or cat-fish. In our salamanders they disappear at various periods of growth, and sometimes leave traces in the form of an angle or swelling beneath the nostril on the lip, and sometimes as in the supposed species *Spelerpes cirrigera*, as a tentacle, or cirrus. Influenced by this consideration I referred Green's salamanders to his *Sp. bilineatus.**

In the course of collecting in the Alleghany region of Tennessee and North Carolina, I became satisfied of the propriety of this step. While in the recesses of a cave in the valley of Tennessee, in Jefferson county, I found a very fine specimen of *Spelerpes longicauda* of a red orange color, which had well developed tentacles on each side, precisely as in the cirriferous *Sp. bilineata* of Green. Subsequently in ascending the Black Mountains in Buncombe county, North Carolina, I found five specimens of the typical form of *Sp. bilineata*, of which three were tentaculate, and two were not. Finally, in a considerable number of the *Sp. guttolineata*, from the headwaters of the French Broad in North Carolina, one presented the same feature of well developed tentacles.

This irregular preservation of a larval character, is of interest in connection with the theory of evolution. Should the presence of these tentacles be permanent in any species, it is not to be doubted that the character would be regarded as generic, and justly so. Its history would in that case be like the history of *all other* generic characters as representing the undeveloped stage of another type, if not itself the *ne plus ultra.* Should it be constant in a color variety only of some species, and wanting in other varieties, and in other species, the first would become the type of another genus, whatever its claims to specific distinction might be. The latter would of course follow the former! If, however, the naturalist of the old school had any suspicion that the two forms may have had a common origin, he would ignore the distinctions. The proper course appears to me to recognize characters as definitive when they are *constant*, and discuss their history afterwards.

---

* See Proceedings of the Academy of Natural Sciences, 1869. p. 107.